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Donald F. Haas
Date: October 7, 2003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

DAVIS S. BROWN and
RICHARD E. ROBERTSON

Serial No. 09/832,070

Filed April 10, 2001

NICKEL-CONTAINING ETHYLENE OLIGOMERIZATION CATALYSTAND USE THEREOF

Group Art Unit: 1755

Examiner: James W. Pasterczyk

October 7, 2003

COMMISSIONER FOR PATENTS
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

RESPONSE TO REJECTION

REMARKS

The following remarks are submitted in response to the final rejection of July 14, 2003. All the claims, 1-32, have been rejected under 35 U.S.C. Section 103(a) as being unpatentable over Xue. This rejection is respectfully traversed.

The cited reference does not disclose or suggest the use of a water soluble base in the reaction to produce the catalyst composition. This is a required element of the present claims.

Following the teachings of the cited reference leads to an acidic reaction. This acidic reaction causes the production of a different slate of products, i.e., products which have a lower number of carbon atoms. This can be seen by looking at the product distribution in the two tables in the reference. The products with a higher number of carbon atoms, C_{10+}, represent the minority of the total composition of the product slate. The highest percentage is in number 1 in Table 1 and that is only 39.83 percent.

In contrast, the products of the present invention produce a product slate which maximizes the amount of products with higher numbers of carbon atoms. The K factor data for the examples of the present application shown in Table 1 prove this. All known oligomerization catalysts produce a Schulz-Flory distribution of oligomer products. These product distributions are commonly described using the Schulz-Flory K factor, which is defined as (moles C_{n+2} oligomers)/(moles of C_n oligomers). A K factor is determined experimentally based on the carbon number distribution of a given oligomer product. Conversely, if one knows the K factor, the carbon number distribution associated with it can be calculated. The carbon number distributions for the K factors in Table 1 of the present application are reproduced in the following table:

Table 1. Rate and K-factor data with product distributions in weight percent.

Example	Relative Rate	K-Factor	C_4	C_6	C_8	C_{10+}
1	1.3	0.728	11.5	12.5	12.3	63.7
2	0.65	0.747	10.0	11.3	11.3	67.4
3	1	0.735	10.9	12.0	11.9	65.4

It can be seen when the catalyst made according to the process of the present invention is used, the product slate includes products having 10 or more carbon atoms in the amount of 63.7 to 67.4 percent. This clearly indicates that the process of the present invention produces a different product slate than the process described in the reference.

As stated on page 6, lines 13-23, of the present specification, the water soluble base, preferably potassium hydroxide, is added to adjust the pH. The soluble base adjusts the pH of the reaction so that it is not acidic enough to disturb the production of a product slate which emphasizes products with a higher number of carbon atoms.

Since the claims of the present invention all require the use of a water soluble base in the process to achieve a different product slate than achieved by the reference and since the reference does not disclose or suggest the use of a water soluble base in its product, the Applicants assert that the rejection has been overcome and respectfully requests an early notice of allowance.

Respectfully submitted,

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